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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/641,379	08/14/2003	Yunbiao Shen	D5437	1247
30409	7590	01/12/2006	EXAMINER	
INTERNATIONAL ENGINE INTELLECTUAL PROPERTY COMPANY			MCCALL, ERIC SCOTT	
4201 WINFIELD ROAD			ART UNIT	
P.O. BOX 1488			PAPER NUMBER	
WARRENVILLE, IL 60555			2855	

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/641,379

Applicant(s)

SHEN, YUNBIAO

Examiner

Eric S. McCall

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9, 12, 13 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12, 15-17, 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-9, 13 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**APPARATUS AND METHOD FOR EVALUATING**  
**FUEL INJECTORS**

**NON-FINAL OFFICE ACTION**

In response to the Applicant's Request for Continued Examination dated Nov. 29, 2005.

**CLAIMS**

**35 U.S.C. § 112**

*(First Paragraph)*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 2855

Claims 3 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, the Applicant's originally filed disclosure fails to set forth how combustion in the chamber (217) as claimed takes place.

*(Second Paragraph)*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

As set forth previously, claim 3 remains rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention because claim 3 sets forth that "the chamber is a combustion chamber". However, the Applicant's disclosure (paragraph 16) sets forth that the chamber only "simulates" a combustion chamber. Thus, a contradiction exists.

The Applicant remarks have been considered but have not been found to be persuasive. The Applicant has set forth in their disclosure that element 217 is the "chamber" as claimed. Element 217 is clearly not a combustion chamber but instead only simulates a combustion

chamber. For example, if element 217 is a combustion chamber in an internal combustion engine as now argued, the question would arise as to how and why drain lines (221) would be connected to a combustion chamber as shown in Fig. 2 since such drain lines connected to a combustion chamber do not exist in a typical internal combustion engine.

The Examiner points out that claim 3 should read --The apparatus of claim 2, wherein the chamber simulates a combustion chamber.--

Also, claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention because claim 13 is set forth as depending from claim 10, however, claim 10 has been cancelled.

And, claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention because the claim contradicts the Applicant's disclosure in that the disclosure never sets forth that the fluid inside the chamber is combusted.

35 U.S.C. § 102

In response to the Applicant's amendments, the rejection of claims 1-4, 7, 8, 10, 11, 14, 16, and 18 under 35 U.S.C. 102(a) as being anticipated by Wlodarczyk et al. (6,622,549) has been overcome. However, the following applies:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-4, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Rueger (6,712,047).

With regards to claim 1, Rueger teaches an apparatus comprising:

a fuel injector (1) for an internal combustion engine operably connected to a fluid supply system and having a nozzle disposed at a distal end (bottom of Fig. 1) of the fuel injector, wherein said nozzle has a fluid cavity (area surrounding the needle 11);

at least one discharge port disposed in the nozzle (injector discharge port at the bottom of Fig. 1);

an orifice (passage which contains throttle 8) disposed in the nozzle; and

a pressure sensor (D) adjacent to the orifice, wherein fluid in the fluid cavity is in fluid communication with the pressure sensor, such that the pressure sensor measures fluid pressure.

With regard to claims 2-4, the nozzle of the prior art inherently is mounted to and protrudes into a chamber for the receiving of fluid from the discharge port as claimed because the nozzle of the prior art's fuel injector inherently protrudes into a combustion chamber wherein the combustion chamber receives fluid discharged from the fuel injector via the discharge port.

With regards to claim 7, the prior art inherently teaches the fluid supply system comprising a fluid tank and a fuel pump because the prior art teaching centers around a fuel injection system for an internal combustion engine, and fuel injected internal combustion engines inherently have a fuel tank and a fuel pump for supplying fuel to the fuel injected system.

With regards to claim 8, the prior art suggests a monitoring device attached to the pressure sensor (col. 3, lines 41-46).

35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rueger (6,712,047).

Rueger teaches a pressure sensor (D) but fails to specifically teach the material from which the pressure sensor is made and thus fail to teach the pressure sensor being a piezoelectric quartz transducer as claimed.

Nonetheless, it would have been obvious to one having ordinary skill in the art armed with said teaching to use a piezoelectric quartz transducer pressure sensor as the pressure sensor in the Rueger teaching.

The motivation being that a piezoelectric quartz transducer is a well known and commonly used type of pressure sensor and because of its reliability and durability would be



appropriate for being used in the environment as set forth by the Applicant as suggested by the use of piezoelectrics in the actuator of Rueger.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rueger (6,712,047) in view of Bunch, Jr. et al. (5,000,043).

With regards to claim 5, Rueger fails to teach a pressure control valve as claimed.

However, Bunch, Jr. et al. do teach such a pressure control valve (30).

As a result, it would have been obvious to one having ordinary skill in the art armed with said teachings to include the pressure control valve as taught by Bunch, Jr. et al. with the teaching of Rueger.

The motivation being in order to control the pressure of the chamber for the proper testing of the fuel injector.

With regards to claim 6, Rueger fails to teach a flow-metering unit as claimed, but Bunch, Jr. et al. do teach such a flow-metering unit. Thus, it would have been obvious to one having ordinary skill in the art armed with said teachings to include the flow-metering unit as taught by Bunch, Jr. et al. with the teaching of Rueger.

The motivation being in order to control the pressure and flow of the chamber for the proper testing of the fuel injector.

*Allowable Subject Matter*

Claims 12, 15-17, 19, and 20 have been found to be allowable over the prior art.

*Response to Arguments*

With respect to the Applicant's arguments pertaining to the 35 U.S.C. 112, second paragraph, rejection, said arguments have not been found to be persuasive. The reasoning as set forth above in the corresponding rejection.

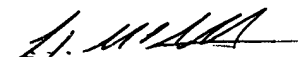
With respect to the Applicant's arguments pertaining to the rejections over the prior art, said arguments are deemed moot in view of the new grounds of rejection with resulted from the Applicant's amendments to the claims.

**CONTACT INFORMATION**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric S. McCall whose telephone number is (571) 272-2183.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eric S. McCall  
Primary Examiner  
Art Unit 2855  
Jan. 06, 2006